

SUBORBITAL SUCCESS—

Apollo 202 Brings Program Step Nearer Manned Flight

Project Apollo last week moved another step toward qualifying the Apollo command and service modules and the uprated Saturn I launch vehicle for manned flight as Apollo/Saturn 202's command module smoked back into the Pacific atmosphere after a suborbital flight of more than 17,000 miles.

Although no decision has been made to fly a crew aboard A/S 204 until all data from the 202 mission have been thoroughly evaluated, NASA Associate Administrator for Manned Space Flight Dr. George E. Mueller said at a postflight press conference that "I don't know of any knowledge that we have at the present time that precludes manning of the next Apollo/Saturn flight; on the other hand we haven't examined the situation (A/S 202 results) and we really won't know for about another two months."

Liftoff of Apollo 202 was at 11:15:32 CST following two holds in the countdown—one caused by problems in verifying errata entered in a computer program aboard the tracking ship *Rose Knot* and the other, at T-3 minutes, to reverify the level of RP-1 propellant in the Saturn I first stage.

Nominal Launch

Launch phase events and trajectories followed the nominal profile quite closely, including a major burn of some 215 seconds of the Service Module Propulsion System (SPS) which placed the spacecraft into a "high-energy earth-intersecting ellipse for a steep entry angle." In a repeat of the S-IVB stage bulk-head structural integrity test that was conducted during A/S 203, the liquid oxygen vent was opened 90 seconds after Apollo 202 spacecraft separation. The purpose of the tests on both missions was to measure the strength of the common bulk-head separating the liquid hydrogen tank from the liquid oxygen tank. In A/S 203 the differential pressure reached 34 psi at last ground reading before the S-IVB stage disintegrated. In Apollo 202, the tracking ship *Rose Knot* read a value of 25 psi differential pressure as the S-IVB stage "went over the hill" to loss-of-signal. The Apollo 202 S-IVB stage impacted in the Central Atlantic just north of the Equator.

An apogee of 660 nm for the command and service module combination came over the Union of South Africa. A second SPS burn of 85 seconds came as the spacecraft passed to the north of the Carnarvon, Australia tracking station to place the

spacecraft into a high-heat atmosphere entry condition. The third and fourth SPS burns of three seconds each took place 700 miles west the tracking ship *Coastal Sentry*, hove to in the Arafura Sea just north of Darwin, Australia. These two small "blips" of the SPS were primarily a test of the SPS restart capability in low propellant quantity conditions.

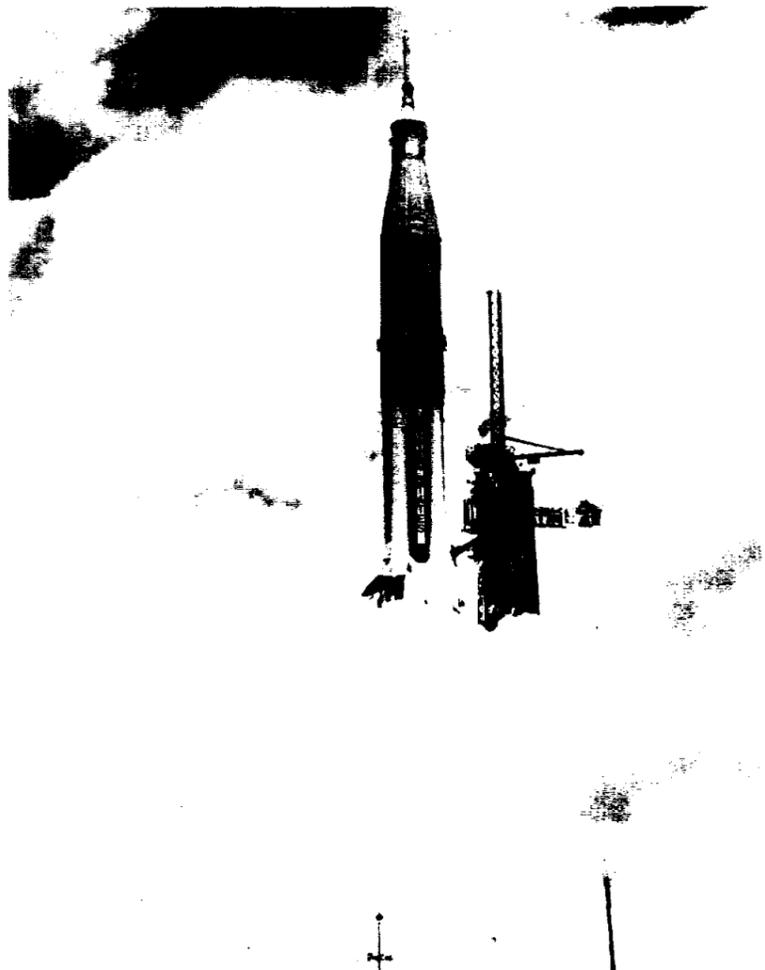
Undershoot

Command/service module separation, although not immediately confirmed by *Coastal Sentry's* telemetry, took place almost directly above the ship and the command module went into communications blackout over the north coast of New Guinea at 19,400 mph. During the entry phase of the mission, several HC-130 "Herky Bird" aircraft equipped with Unified S-Band receivers were strung out along the entry footprint and several aircraft got momentary signals from the spacecraft USB transmitter.

Splashdown was some 200 nm uprange from the prime recovery vessel, the carrier *USS Hornet*. Location was pinned down to 16.07° N. Lat. by 168.54° E. Long. by search aircraft homing in on the spacecraft high-frequency recovery beacon. The first aircraft on the scene reported that the spacecraft was floating in the upright "Stable I" position before descending to

drop a pararescue team to attach the spacecraft floatation collar. One member of the first three-man pararescue team became entangled in his parachute shroud lines and a second team member went to his aid. The two men drifted too far away from the spacecraft to swim back and a second three-man team was dropped from another aircraft to attach the floatation collar. Helicopters from the *Hornet*, now steaming at 30 knots toward the spacecraft, later picked up the pararescue men. The *Hornet* reached the spacecraft in the midst of a local rain squall which

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PACIFIC EXPRESS—Apollo/Saturn 202 lifts off Launch Complex 34 en route to a spot near Wake Island in the Central Pacific in a major test of the spacecraft heatshield and systems and of the uprated Saturn I launch vehicle.

Gemini XI Mission Schedules First Full-Automatic Reentry

Gemini XI and its Agena Rendezvous Vehicle will be launched no earlier than September 9 from Kennedy Space Center, Fla.

The three-day mission will include rendezvous and docking with the Agena during the spacecraft's initial revolution, use of a power tool to perform work tasks during extravehicular activity, and maneuvering the spacecraft to an apogee of 750 nm.

Other activities to be performed as time and propellant

allow are station-keeping by tethering the spacecraft to the Agena, completion of 12 experiments, some of which will be conducted during a more than two-hour standup EVA, and additional docking practice.

The controlled reentry will be fully automatic. Reentry control commands will be computed and executed by the onboard systems.

Gemini XI command pilot is Charles (Pete) Conrad. Pilot is Richard F. Gordon. Backup command pilot is Neil A. Arm-

strong, and William A. Anders is backup pilot.

Launch time for the Gemini Agena Target Vehicle (GATV) is 7:48 am CST. Gemini XI is scheduled to lift off at 9:25 am CST.

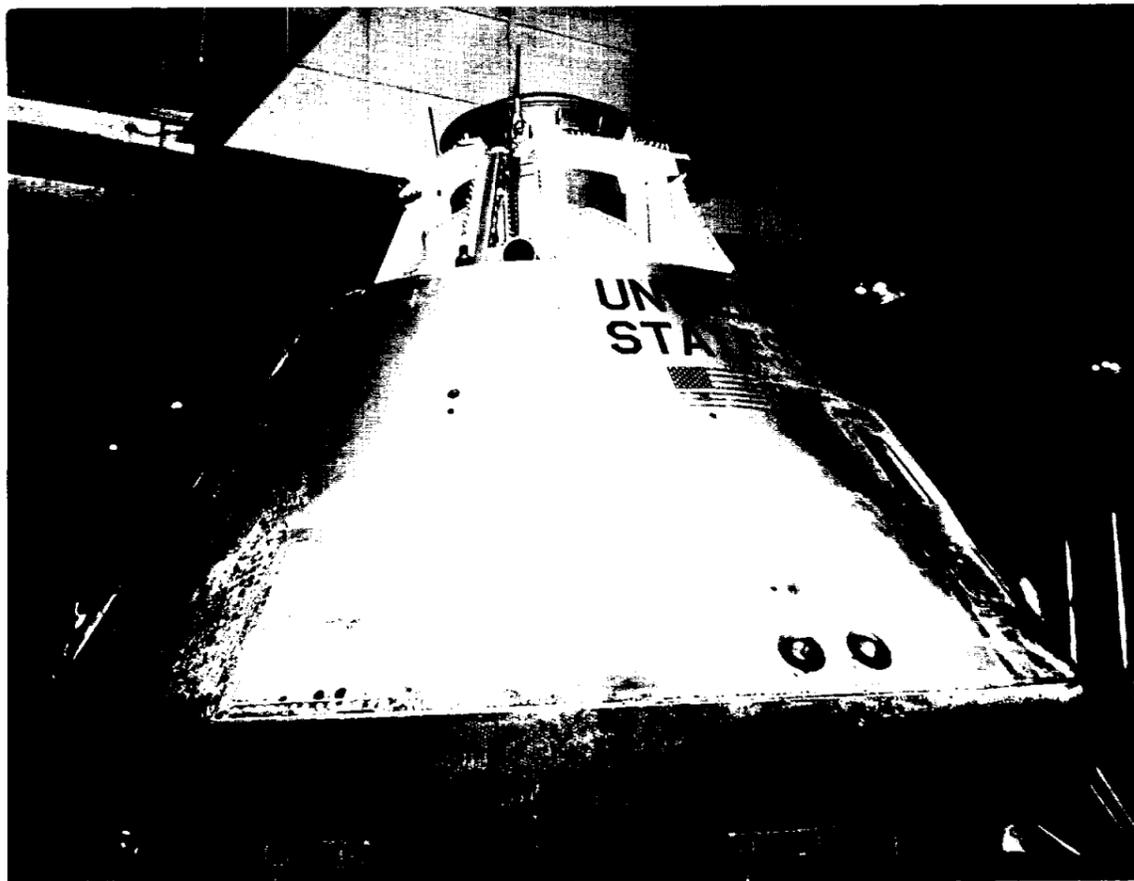
The Agena will be launched into a 161 nm circular orbit by an Atlas Standard Launch Vehicle (ASLV). Gemini 11 will be launched 97 minutes later into a 87 by 146 nm orbit from which it will attempt a first-revolution rendezvous with the Agena. Docking is programmed to occur over the United States near the end of the first spacecraft revolution.

Just before the start of Gemini XI's second day in space, Gordon will begin his umbilical EVA over Hawaii at 24:08 hours ground elapsed time (GET). He will be linked to the spacecraft by a 30-foot umbilical. His extravehicular activity will include:

- retrieving the nuclear emulsion experiment (S-9) from the outside of the spacecraft adapter section
- attaching the Agena tether to the spacecraft docking bar
- performing the power tool evaluation (D-16)
- retrieving the hand-held maneuvering unit (HHMU) and the Apollo camera from inside the adapter.
- evaluating the HHMU.

Following the second sleep period, the Agena primary propulsion system (PPS) will "kick" the spacecraft into a 750 nm apogee. The PPS maneuver, a 943-foot-per-second posigrade burn, takes place over the Canary Islands at 40:32 GET. The Gemini-Agena combina-

(Continued on Page 2)



SUNNY-SIDE UP—Apollo spacecraft 011 rests on its dolly aboard the prime recovery vessel *USS Hornet* in the Central Pacific near Wake Island following last week's successful Apollo/Saturn 202 mission. From its outward appearance, the spacecraft survived the 19,000-mph reentry with a minimum of scorching.

Clean Sweep Fore and Aft



FALL POND CLEANING—A portion of MSC's duck colony was evicted temporarily last week as maintenance crews drained the quadrangle ponds for a periodic scrubbing. Fortunately for the ducks, only one pond was drained at a time.

Saturn I Agreement Converted to Incentive

NASA has signed a supplemental agreement with Chrysler Corp., Space Div., New Orleans, which converts the Uprated Saturn I first stage production contract from a cost-plus-fixed-fee to a cost-plus-incentive-fee.

Under the agreement, valued at \$339 million, amount of the contractor's fee will be based on the ability to perform assigned tasks satisfactorily and meet prescribed costs and schedules. New engineering work

amounting to approximately \$13 million is included.

The contract calls for Chrysler to manufacture, assemble and test a total of 12 Uprated Saturn I first stages, provide systems engineering and integration support, ground support equipment and launch services.

The stages are fabricated at the NASA Michoud Assembly Facility at New Orleans, under direction of the NASA Marshall Space Flight Center, Huntsville, Ala. Other services are performed at the Marshall Center and the Kennedy Space Center, Fla.

The supplemental agreement provides for the manufacture, assembly and test of the stages to be subject to incentive fee arrangements and assigns design responsibility to the company.

Incentive arrangements for systems engineering, integration and ground support services will be negotiated separately. Launch services at KSC already have been converted to an incentive basis.

The contract, to continue through February 1969, is managed by the NASA Marshall Center.

'Moonglow 66' Dates Changed

Dates for the 1966 MSC Variety Show "Moonglow 66" have been changed to November 10, 11 and 12. Original dates were November 11-12, 18-19.

Moonglow 66's producer-director Juanita Bower still has a few openings in the show for unusual acts. She can be reached at Ext. 2737. The show's technical director is Hugh Woodsmall.

Musical accompaniment for Moonglow 66 will be the Sam Rayburn high school orchestra.

Gemini XI's Automatic Reentry

(Continued from Page 1)

tion reaches apogee about 51 minutes later over Carnarvon. Gemini XI will remain in the 161 by 750 nm orbit for the next two revolutions. At 43:56 GET the PPS engine will fire for the second time, a 943 fps retrograde burn that restores the orbit to 161 nm circular.

At about 46:00 GET the second extravehicular activity, a 140-minute standup, begins over Tananarive. It ends over Hawaii in the 30th revolution at 48:20 GET.

In the 31st revolution at 49:50 GET the spacecraft will translate to about 30 degrees off the local vertical, the Agena PPS engine pointing toward the Earth. The spacecraft will undock and back off to the limit of the tether (100 feet) above the Agena in a nose-down attitude. The Agena will be stabilized in the engine-down position with its longitudinal center-line pointing toward the center of the Earth. Gemini XI will stabilize itself with its longitudinal axis aimed through the Agena toward the Earth's center.

At this time the spacecraft orbital attitude and maneuvering system (OAMS) and the Agena attitude control system (ACS) will be deactivated. If the spacecraft has been positioned properly and if the relative velocities between the two vehicles do not exceed .2 feet-per-second, a station keeping, gravity gradient stabilized position will have been established to retain both vehicles in their relative positions and attitudes as they circle the Earth.

If this procedure proves impractical, a slow rotation of the tethered Gemini XI and Agena

will be initiated. Centrifugal force is expected to maintain the tautness of the tether, keeping the vehicles at a controlled distance from each other and minimizing the amount of propellant required for the station-keeping maneuvers practiced on previous Gemini missions.

The tether exercise will be completed at 53:00 GET in the 33rd revolution.

As Gemini XI passes over the east coast of Africa on its 34th revolution a retrograde maneuver will lower the orbit perigee in preparation for retrofire. Magnitude of the maneuver will be determined by the amount of OAMS propellant left. Scheduled time of retrofire is 70:40 GET.

Reentry will be controlled by the spacecraft onboard computer in the automatic mode. The computer and the inertial guidance system (IGS) feed bank-angle commands into the attitude control and maneuver electronics

(ACME) which control the reentry thrusters.

The crew will monitor the flight director indicator (FDI) needles during the automatic reentry but will not make manual steering maneuvers. Gemini XI will be the first American space flight to employ automatic guided reentry. Previous missions have used manual closed-loop guided or unguided ballistic reentry techniques.

Splashdown will occur approximately 30 minutes after retrofire and will be in the West Atlantic recovery area 45-1, some 725 miles east of Cape Kennedy.

After splashdown and recovery, flight controllers will command a series of Agena maneuvers to evaluate the vehicle's propulsion system. The Agena then will be transferred to a parking orbit for possible use as a passive target to future manned missions.

MSC Wage Board Employees Get Pay Hike

Pay raises will be included in the September 16 checks of some 208 MSC Wage Board employees in the Houston area,

it was announced by the MSC Personnel Office.

The new pay schedules, averaging 3.1 percent increase, apply

NASA, MAC Negotiate Apollo Airlock Contract

NASA has selected McDonnell Aircraft Corp., St. Louis, Mo., for negotiations of a fixed-price contract to produce an airlock for an experiment in which spaceflight crews will enter the empty hydrogen tank of a spent Uprated Saturn I second stage. The work is estimated to cost approximately \$9 million.

The airlock will be used as an additional experiment on a currently planned Apollo Earth orbital mission. It will provide a 65-inch diameter airlock between the Apollo spacecraft and the S-IV B stage hydrogen tank, and environmental and life support systems to make the tank habitable.

A hatch in the airlock will permit egress into space without depressurization of the tank or the spacecraft. Overall length is about 15½ feet. Weight will be approximately five tons.

Existing flight hardware to be used extensively includes Gemini equipment and docking assembly identical to that on the Apollo lunar module. The unit will carry additional hydrogen and oxygen to extend the capability of the spacecraft fuel cell power system and life support system for longer-duration missions.

The airlock will be stacked on the space vehicle between the Saturn and the Apollo using lunar module mounts. In orbital flight the command and service modules will separate, dock with the airlock unit, and the crew will activate systems to pressurize the spent hydrogen tank for habitation.

The objectives of the airlock experiment would be to investigate the feasibility of using a launch vehicle spent stage in orbit as a large habitable space structure and to develop the capability to carry out long duration manned space flight missions in large habitable structures.

McDonnell was one of three firms which performed definition studies of the airlock unit under contract to MSC. The overall experiment is being managed by the NASA Marshall Space Flight Center, Huntsville, Ala., with MSC having technical and contractual responsibility for the airlock. The contract provides for one flight article and associated support with options for additional units.

A spent stage experiment mission is to be carried out no earlier than 1968.

Hourly pay rates authorized on this wage schedule apply only to NASA wage board employees assigned within commuting distance of Manned Spacecraft Center

WB	Non-Supervisory				WL	Leader				WS	Supervisory			
	Step 1	Step 2	Step 3	Step 4		Step 1	Step 2	Step 3	Step 4		Step 1	Step 2	Step 3	Step 4
1	2.03	2.14	2.25	2.35						1	2.82	2.97	3.12	3.27
2	2.18	2.29	2.40	2.52	1	2.23	2.35	2.47	2.59	2	3.11	3.27	3.43	3.60
3	2.32	2.44	2.56	2.68	2	2.39	2.52	2.65	2.77	3	3.38	3.56	3.74	3.92
4	2.45	2.58	2.71	2.84	3	2.55	2.68	2.81	2.95	4	3.52	3.71	3.90	4.08
5	2.59	2.73	2.87	3.00	4	2.70	2.84	2.98	3.12	5	3.67	3.86	4.05	4.25
6	2.74	2.88	3.02	3.17	5	2.85	3.00	3.15	3.30	6	3.80	4.00	4.20	4.40
7	2.88	3.03	3.18	3.33	6	3.01	3.17	3.33	3.49	7	3.94	4.15	4.36	4.57
8	3.01	3.17	3.33	3.49	7	3.16	3.33	3.50	3.66	8	4.09	4.30	4.52	4.73
9	3.15	3.32	3.49	3.65	8	3.32	3.49	3.66	3.84	9	4.28	4.51	4.74	4.96
10	3.30	3.47	3.64	3.82	9	3.47	3.65	3.83	4.02	10	4.45	4.68	4.91	5.15
11	3.52	3.70	3.89	4.07	10	3.63	3.82	4.01	4.20	11	4.78	5.03	5.28	5.53
12	3.73	3.93	4.13	4.32	11	3.87	4.07	4.27	4.48	12	5.11	5.38	5.65	5.92
13	3.95	4.16	4.37	4.58	12	4.10	4.32	4.54	4.75	13	5.44	5.73	6.02	6.30
										14	5.77	6.07	6.37	6.68

FLIGHT AWARENESS—

Top Industry Employees Witness Launch of Apollo 202 at Cape

Thirty-two employees of twelve firms producing the spacecraft and launch vehicle witnessed the launch of Apollo/Saturn 202.

The trip to visit the spaceport and view the Apollo launch was in recognition of outstanding performance in NASA's Manned Space Flight Awareness program. The program emphasizes the need for error-free performance in the shops where equipment for manned space flight is built.

Implemented by prime contractors and subcontractors, it is a concerted effort to make each individual in the Apollo program aware of the vital role he plays in assuring the success of a mission and the safe return of flight crews.

To reward excellent individual performance in the Manned Flight Awareness activity, an invitation was extended to contractors and subcontractors to allow members of their organizations most responsible for error-free performance to attend an Apollo launching.

Those attending the Apollo 202 launching were:

A. M. Long; Floyd Balsley and Angelo Vaglio of Bendix; John Million; Alfred E. Bruer; and Thomas Wall of Boeing Company (Stresskin Products Company); Joseph F. Gaulin; Betty J. Alley; R. W. Sibley; E. F. Rouse; C. W. Meadors of Chrysler; W. E. Thrasher; Larry A. Horton and Homer L. Hunt of Douglas.

Also A. P. Heyman and William D. Cartwright of General Electric; Thomas Carmody; Frederick Delamain; John Krivda of Grumman; Robert Scott of Pratt & Whitney; John S. Johnson of AVCO; A. F. Olaisen; John Zeno Walmer; Roger A. Coulombe; Tom C. Dallas of NAA/S&ID.

Also Chesterfield H. Janes, Jr.; Billy G. Kincer; and Robert F. Richardson of IBM; Mrs. Marilyn Johnson and Miss Helen Larsen of A. C. Electronics; William L. Foschaar

Singletons Plan Autumn Dance September 24

The MSC Singleton Club plans an autumn dance September 24 at the Villa Monterey Third Club Section, 9150 Gulf Freeway. The semi-formal dance will get under way at 9 pm and will last until 1 am. Live music, beer and setups will be furnished. Nonmember tickets run \$2 for men, \$1 for ladies; member tickets are \$1.50 for men and \$.50 for ladies.

The Singleton Club September 20 will hold a business meeting at the Ellington AFB Officers Club to elect a new president to replace Jim Dunlap who is leaving to attend Duke University. All Singleton Club members are urged to attend.

and Warren H. Michael of Rocketdyne.

Here was the scene at the Flight Awareness group's viewing stand:

The West grandstands were filled. There was a purchasing agent from Grumman. A draftsman from Chrysler. A research mechanic from Boeing. A propellant processor from Rocketdyne. A high-pressure mechanic from Bendix. And many more . . . 37 in all. Some brought their wives along. For, after all, as one remarked, "This is the biggest event of my life—bigger than my trip to Carlsbad—or the World's Fair!"

Apollo welder Helen Larsen watched the 650-ton rocket as it lifted slowly from the great fireball that engulfed its base.

A cheer came from the stands. Then, a silence so overwhelming that for an instant one could hear the great long-necked birds call from across the lagoon.

A/S 202 was underway, slipping silently beneath the dark, low hanging clouds. The silence was then shattered by man-made thunder that belted the gallery in its viscera, triggering whoops of joy.

Later, recalling the launch, Helen Larsen captured the feeling of everyone who watched the sky that hot unsettled morning: "I took seven pictures before it went out of sight. Boy!" she grinned, "I only wish I had had four eyes to watch it all!"

Indeed it was a spectacular launch, even to the veteran bird-watchers of rocketland who streamed out of office buildings and rushed from cafeteria lines at the moment of liftoff.

Helen Larsen won the trip to Cape Kennedy as a reward for outstanding work in support of the Apollo program. She is a welder at the AC Electronics plant in Milwaukee. For the past two years she has been welding critical connections for the Apollo navigation and guidance system. Her record shows 22,000 welds without a single error.

She and Marilyn Johnson, a fellow honoree from AC, snapped dozens of color pictures which they plan to show to plant employees upon their return.

Ray Crimmel, AC's Motivation Chairman, accompanied the group, bringing his family along for a surf-and-sand work-vacation. "At AC," says Crimmel, "our awards program emphasizes the personal challenge. As in Helen Larsen's case, we find that we really don't have to motivate these people. The more complex a module, the more people like Helen apply themselves. They want to do the best job that can be done. You might say that the pursuit of excellence is a way of life with them."

One aspect of the highly successful thirteenth Saturn flight clearly bothered the AC contingent, and they made no bones about it.

"That briefing officer on the beach really bugged me!" said one. The others roared in indignant agreement. "What did he mean when he said IF the bird is going to go today. Of course it was going to go! We all knew that. Didn't that guy know he was talking about OUR BIRD? We knew it was going to work right the first time because we knew we had built it right." (One of Miss Larsen's servo amplifiers was on the AS 202.)

Their pride in their work and their confidence in the space program was infectious.

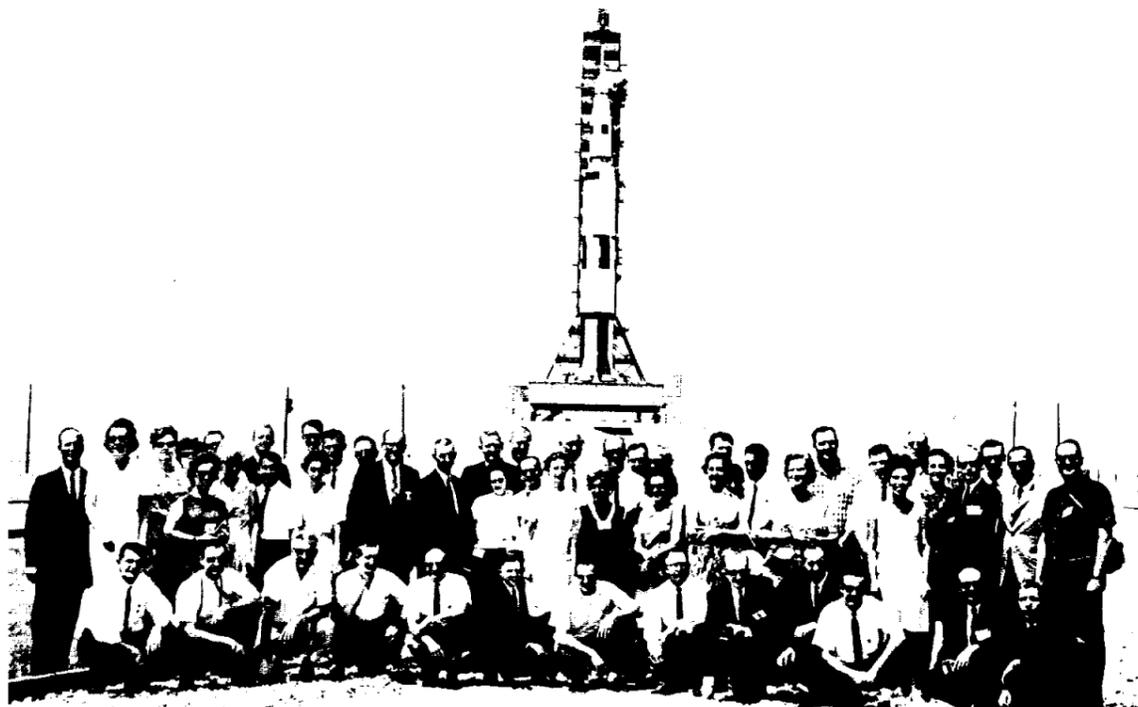
After the briefing officer had been verbally drawn and quartered, Roger Colombe, a senior test engineer from North American, summed up his feelings, "I'm so overwhelmed, I can't think of any words that would adequately express the way I feel today. I have been in the aerospace business for 15 years, and this is the first launch I have witnessed. This is a dream come true—and in living color! I can't tell you what an experience this has been, or what it means to meet the men who fly our products. I feel what the crews are doing, they are doing for me, and I only find myself wishing that I could do more for them in return."

His modesty obscures the fact that he earned his trip to the Cape for "demonstrating initiative, originality, and imagination in support of Checkout Station 2D ACE equipment testing." The NAA commendation continues, "This device will reduce test time and result in a reduction of expenditures and enhance schedule position." The Colombe device, which was built on his own time and with his own funds, has since found wide application in other areas of the company's electronics testing programs.

Straining at the Hold-downs



PRACTICE FOR LAUNCH—Apollo/Saturn 202 is shown during a count-down demonstration at Complex 34 in which the launch vehicle was fueled and the service structure rolled back from the pad—everything as complete as on launch day except for liftoff.



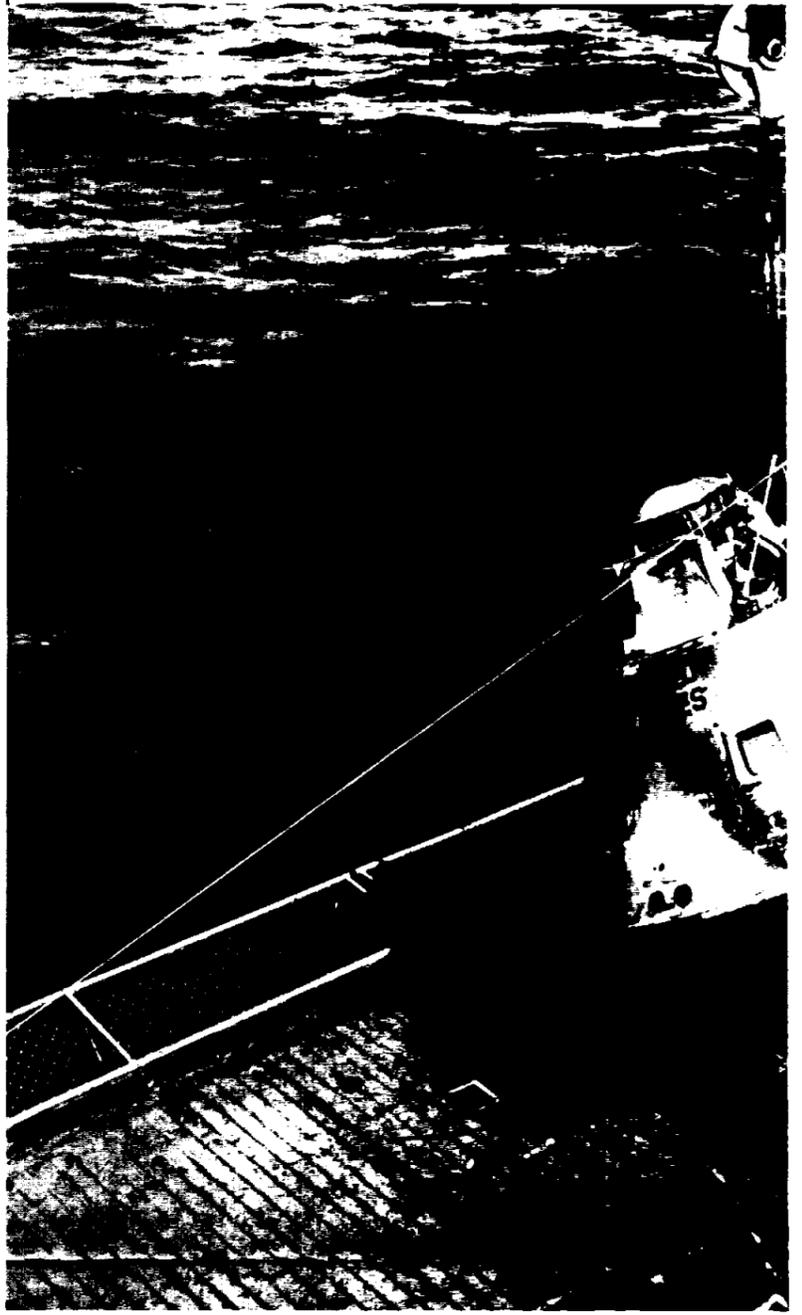
ERROR-FREE—Thirty-two employees of 12 firms producing Project Apollo hardware were recognized for their outstanding error-free performance when they were invited to Kennedy Space Center to witness the launch of Apollo/Saturn 202 as a part of NASA's Manned Space Flight Awareness program. Here the group (some with wives along) stand before the Saturn V facility vehicle on the mobile launcher at Launch Complex 39.

Rand McNally Was Right



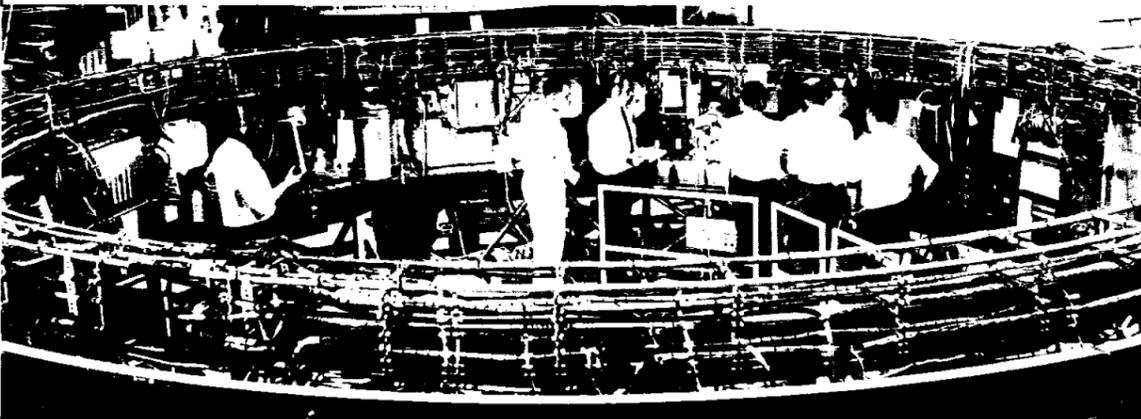
JUST LIKE IN THE GEOGRAPHY BOOKS—This montage of 14 photos from the Nimbus II weather satellite's Automatic Picture Transmission System (APTS) covers the continental United States and Mexico. Nimbus II is in a near-polar 700-mile orbit with a period of 108 minutes.

Request Permissio



CARRIER LANDING, APOLLO STYLE—Apollo Spacecraft 011 is hoisted from the Central Pacific onto the aircraft elevator of the prime recovery vessel USS *Hornet* following last week's successful Apollo/Saturn 202 mission. The spacecraft landed some 200 nautical miles uprange from the *Hornet* and was recovered at 9:20 pm CST. Pararescue men from the 36th Aerospace Rescue and Recovery Squadron based at Tachikawa AFB, Japan were

Saturn's Brain Checked for IQ



CEREBRUM—Technicians at IBM's Huntsville facility run checkouts on a Saturn I instrument unit prior to its delivery to Kennedy Space Center.

Don't Have to Cook Tonight



NAME CAME UP—MSC Federal Credit Union clerk Molly Swan, left, hands a "dinner-for-two" ticket to Joyce H. Dobson, lucky winner in the latest credit Union drawing. Margaret Matthews and Charlotte McKinney stand behind the television set for which the final Credit Union drawing will be made September 30. Two more dinner-for-two drawings will be made before the final drawing.

In the Driver's Seat



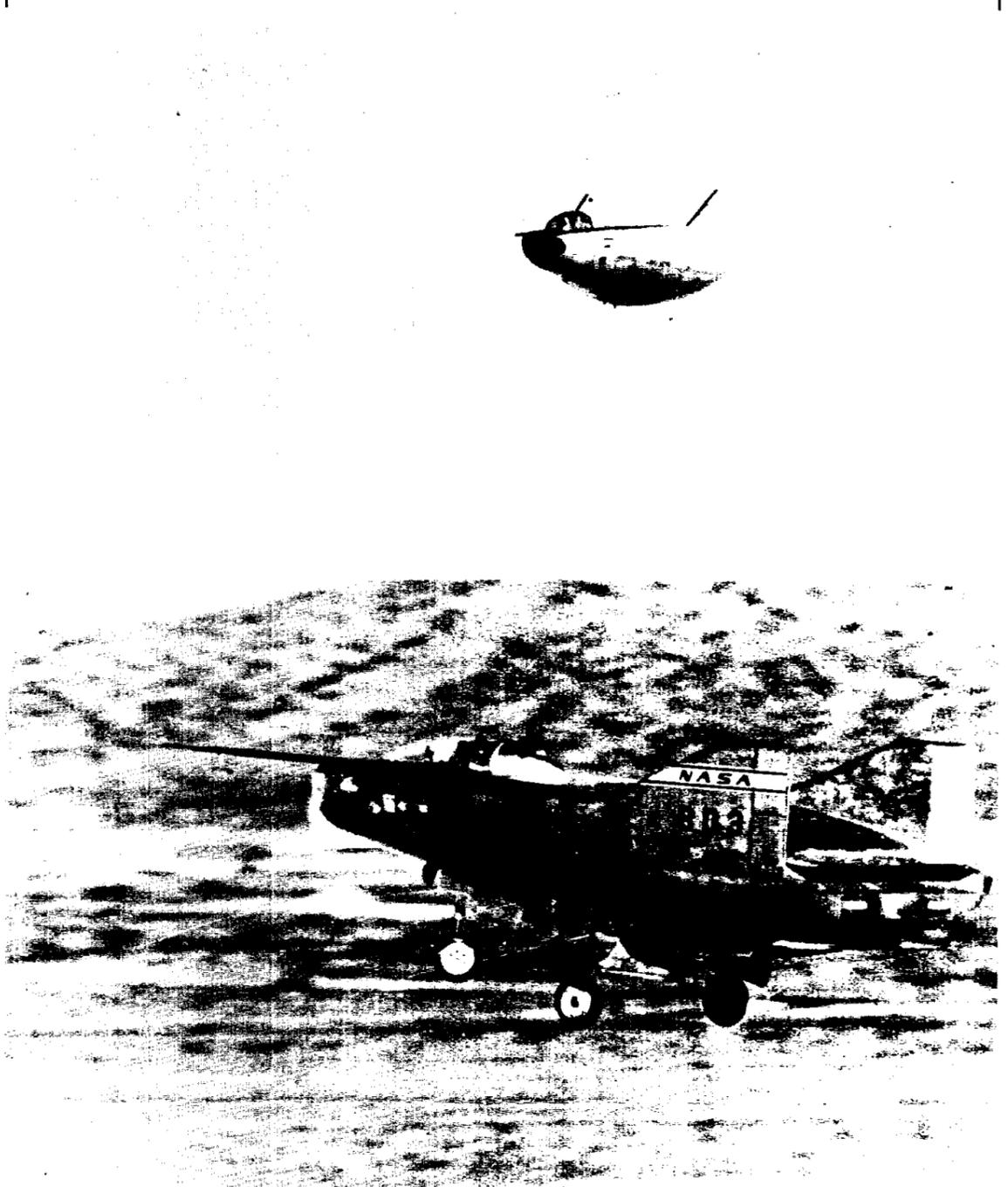
FOCAL POINT—Apollo 202 Flight Director John Hodge polls the flight controller positions in the Mission Operations Control Room for each position's status prior to the liftoff of Apollo 202. The kiddie-type steering wheel placed atop the console is not standard equipment.

... to Come Aboard



... dropped from HC-130 aircraft deployed from Wake Island and attached the Apollo floatation collar to the spacecraft. Helicopters from the *Hornet* picked up the pararescue men several hours before the ship reached the spacecraft's landing point. Local squalls in the recovery area caused swells from six to eight feet to make the hoisting operation a bit tricky.

Glides Like a Brick



SPACECRAFT OF FUTURE?—NASA Flight Research Center test pilot Milton Thompson lines up the wingless M2-F2 lifting body research vehicle for a 175-mph landing on Rogers Dry Lake in California. Lower photo shows Thompson in a pre-flight cockpit checkout of the M2-F2 as it hangs from a pylon under the wing of the B-52 launch aircraft. The lifting body concept is under investigation as a possible configuration for spacecraft that would permit maneuvering flight to a ground landing after reentry.

That CG Must Be Here Someplace



FITTING OUT—Gemini XI command pilot Charles "Pete" Conrad is checked to see that his center-of-gravity is in the right place on the weight-and-balance rig at Kennedy Space Center. The calibrations of weights and CGs of pilots and ejection seats allow engineers to calculate the all-up spacecraft values for the three-day mission scheduled for launch September 9.

OUT OF TEXAS' PAST—

Was Posthumous TV Signal Really From Defunct Station?

Houston's pioneer television station, KLEE, went off the air more than 16 years ago, in July of 1950. It had been bought by the owners of the station now operating on Channel 2. Fanmail addressed to KLEE continued to trickle in to the Houston post-office, whence it was forwarded to KPRC-TV. But by the fall of 1953 KLEE mail appeared to have stopped forever.

Then came the mysterious letter from London that rocked the world's astronomers, exobiologists, space scientists and electronics engineers on their heels.

The letter was from Charles W. Batley, of London. He enclosed a photograph of what he said was the screen of his telly, showing a KLEE test pattern: a photo he said he had taken on Sept. 14, 1953.

But KLEE had not emitted a test pattern or any other kind of signal, audio or video, for more than three years!

The story broke worldwide with the impact of a space spectacular, but sometimes it was handled badly. For example, one report said that, back when KLEE had been operational, its video signal had been very QSA in Nova Scotia. That may have been true, for TV signals can bounce off the ionosphere. But the reporter failed to observe that, while Canada and the United States use the same system, the English system is incompatible with the American.

Did Batley have an American receiver? Most unlikely. Would you spend good money for an English telly?

Another curious point: Ostensibly, Batley supposed he had received a live, skip-effect signal. Why, then, had he gone to the trouble to enclose a photograph?

Still others: Paul Huhndorff, chief engineer at KPRC-TV, received a letter from a man named George Baron, of Lancaster, England, who said he received the KLEE pattern several times in 1954. And Ed Mikulencak, of Moulton, Texas, told Huhndorff that he saw the pattern on his TV on Feb. 14, 1954.

Skeptics, scoffers and dabblers in the supernatural went to town with the KLEE mystery. Here are some of the resulting theories:

1. The signals were bounced off an object one and a half light-years distant.

2. Intelligent beings on another planet had received, stored, analyzed and retransmitted the signals on their original frequency.

3. The thing was an electronic or photographic hoax, engineered by some joker with a ham rig in England, or more likely in Ireland, or maybe by Batley himself.

4. It was not really a KLEE test pattern, but a Kleenex commercial.

The story finally got com-

pletely out of hand. A playwright, trying to promote a show about ESP, cited the KLEE phenomenon as evidence that extrasensory information was storable, delayable and bufferable, like computer data. Magazine articles (including one in *Readers' Digest*) and popular-science books (including *We Are Not Alone*, by Walter Sullivan) treated the puzzle seriously.

Some smart people tumbled, including Frank Drake, the National Radio Astronomy Observatory astronomer who headed Project Ozma.

Project Ozma was an unsuccessful program that attempted to monitor radio signals on the hydrogen frequency, 1420.4 mc., from Tau Ceti and Epsilon Eridani with an 85-foot dish at Green Bank, W. Va., in 1959 and 1960. Just 30 miles away, at Sugar Grove, the Navy had begun construction of a dish twice as big as the one at Jodrell Bank, for monitoring the U.S.S.R.; that job was abandoned as unengineerable, but the whole area was protected from QRM by a radio zoning act.

Drake, who named his project for the Princess of Oz, and who once mistook pulses from a secret military radar jammer for traffic from Epsilon Eridani, had

extensive correspondence with Huhndorff, Batley and others in England during the time when he was also being the real live wizard of Ozma. After making the most extensive of all the investigations in the KLEE matter, Drake finally announced that he had decided it was all as phony as the Cardiff Giant, the Loch Ness Monster and the Piltown Man.

Huhndorff said he had never believed any part of the story in the first place; furthermore he was satisfied as to who had conceived and propagated the hoax.

But the KLEE thing won't lie down and die. A new book in the MSC Technical Library, *The Quest: A Report on Extraterrestrial Life*, by Tom Allen, says a woman in Milwaukee claims she saw the lost KLEE test pattern in February of 1962—just four and a half years ago. Like so many such reports, this one omits name and address.

Huhndorff, asked about the Milwaukee QSL, said it was news to him. "I understand, though," he added, "that the KLEE call has been reassigned to a TV station in New England."

Has it, sure enough? Or is the thing getting closer!

—Sigman Byrd

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Space News Of Five Years Ago

September 3, 1961—Thirty days' exposure to simulated vacuum of space killed bacteria by causing them to disintegrate molecule by molecule, was finding of studies reported by the Materials Testing Laboratory of Hughes Aircraft Co. Dr. Charles C. Walence reported that sterilization of space vehicles probably could be eliminated from current planning.

September 8, 1961—A report was made on possible technical advances as a result of the Mercury development program. A few of these are listed: 1. attenuation of impact force from astronaut couch by using crushable honeycomb structure; 2. interchangeable couch configuration for Mercury spacecraft; 3. modified tower clamp ring to improve stability in abort attitude; 4. hydrogen peroxide thrust chamber improvements; 5. oxygen pressure transducer improvements; 6. de-stabilization flap to prevent spacecraft wrong attitude reentry; 7. Mercury spacecraft landing bag design; and 8. multi-nozzle rockets.

September 13, 1961—Mer-

cury-Atlas 4 was launched from Cape Canaveral with special vibration and noise instrumentation and a mechanical crewman simulator aboard in addition to the normal spacecraft equipment. This was the first Mercury spacecraft to attain an earth orbit. The orbital apogee was 123 nautical miles and the perigee was 86 nautical miles. After one orbit, the spacecraft's orbital timing device triggered the retrograde rockets, and the spacecraft splashed in the Atlantic Ocean 161 miles east of Bermuda. Recovery was made by the USS Decatur. During the flight, only three slight deviations were noted—a small leak in the oxygen system; loss of voice contact over Australia; and the failure of an inverter in the environmental control system. Overall, the flight was highly successful: The Atlas booster performed well and demonstrated that it was ready for the manned flight, the spacecraft systems operated well, and the Mercury global tracking network and telemetry operated in an excellent manner and was ready to support manned orbital flight.

Cost Reduction Corner

Altitude start condition in the MSC White Sands Test Facility 33,000-cu ft vacuum chamber was obtained by mechanical pumps, and pump time to evacuate the chamber from ambient pressure to .15 psia was 85 minutes per engine test. Estimates for a 24-in bypass ran \$120,000.

The WSTF Propulsion Engineering Office proposed using the existing steam ejector system to evacuate the chamber, incorporating use of an existing 24-in chamber drain line. Pump-down time was reduced from 85 minutes to three minutes for each test. Lumping the operating time that will be saved over the Lunar Module engine test program and the cost of the modification to the bypass line,

Estimated savings to John Q. Taxpayer was \$116,600.

Search for Recognition Is a Two-Way Street

Five simple phrases and the way they are used can produce more good will among fellow employees than all the hollow patronizing praise put together. Try using these phrases once in a while:

Five most important words: *I am proud of you.*

Four most important words: *What is your opinion?*

Three most important words: *If you please.*

Two most important words: *Thank you.*

Least important word: *I.*

Fostering good human relations on the job is primarily gained through the forming of habits of thinking and acting that cause fellow employees to like us, to trust us and to believe in us—simple habits of friendliness, dependability, sincerity, cheerfulness and honesty. A less important trait in sowing good human relations is the capacity for understanding, tolerance and consideration for the rights and feelings of others, and the willingness to share with and help others.

Recognition is perhaps one of the most basic human needs—the desire to be important, to count, and to have others think well of us. But such recognition is first a two-way street upon which we must extend our own recognition of the good in our fellow workers.

Co-Op of the Month



WHITE SANDS—Richard C. Biel of the MSC White Sands Test Facility Program Control Office is majoring in mechanical engineering at New Mexico State University. At WSTF he prepares facilities utilization reports and documents and reviews GSE and facilities change proposals in addition to preparing information and displays for visitor briefings.

Credit Union Dividends Paid on Whole Shares

The MSC Federal Credit Union reminds shareholders that dividends are paid only on each complete share of \$5, and that dividends can be increased by bringing deposits up to the next even share.

The Credit Union also advises that often a savings can be made by pledging shares toward a loan near the end of the year and thereby avoid a dividend loss. In January the shares are transferred to pay off the loan. Such transfer, the Credit Union emphasizes, is made only upon the shareholder's written instruction.

Whether this sort of procedure would be worthwhile would depend upon the amount of the loan, the loan time period and the length of time the shares have been on deposit.

Often the Credit Union is asked how dividends are calculated. Briefly, dividends are figured thus:

● Dividends are calculated on the basis of shares on deposit at the end of the dividend period (December 31).

● Shares must be on deposit by the 5th of the month to earn

a dividend for that month.

● Dividends are not paid on shares withdrawn from the account before the end of the dividend period (December 31).

● Dividends are calculated on the number of months a share is on deposit. Example: Joe Blow has \$5 on deposit from January to June. On June 5 he deposited an additional \$500. The total \$505 was still on deposit December 31. The \$5 deposit earned dividends for 12 months while the \$500 earned dividends for six months.



Group Blood Deposits To Begin September 14

Some people who have never given blood at a blood bank flinch at the thought of lying back on a plinth and pumping a pint of *their* blood out into a flask. It really isn't all that bad. Perhaps a slight sting as the needle goes in, but when balanced against the good that a pint of blood can do for a patient needing whole blood, the little sting on the forearm is indeed a minor inconvenience.

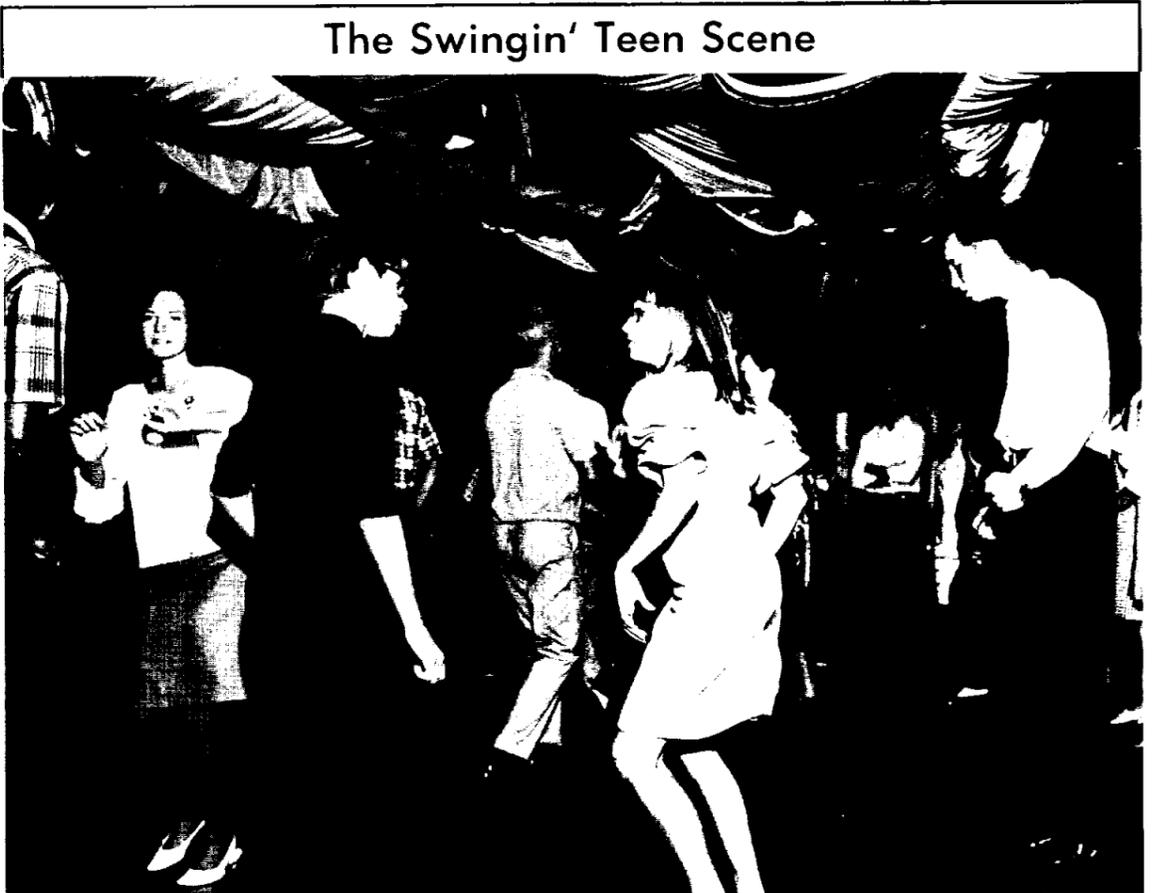
It isn't as though the body's blood supply is not replenished after a pint is drawn out, for the normal life cycle of red blood cells is 120 days. In other words,

Registration Changed For UofH Courses

Registration for University of Houston Clear Lake Graduate Center courses has been changed to September 9. Employees taking the courses may enroll from 9 to 11 am and from 1 to 1:30 pm in Room 102, Bldg. 15.

a person's system is replacing red cells continuously for a complete turnover every 120 days. Moreover, the average person has 12 to 14 pints of blood in his body. One pint subtracted from this volume is not very much, especially if the pint goes to someone who needs it to stay alive.

On September 14-15 and each Wednesday and Thursday thereafter for four weeks a mobile blood bank will be stationed at the east end of Building 8 to collect blood in the first phase of the MSC Employee Activities Association-sponsored Group Blood Deposit Program. If you need moral support to face the needle, call one of the following MSC Group Blood Deposit Program committeemen: Ed Stelly 3378, Bldg. 15; Don Bray 4766, Bldg. 45; Howard Allison 4611, Bldg. 8; Sandy Burdsal 5156, Bldg. 4; or Hal Bishop 5333, Bldg. 2.



ENERGY JUNCTION—Almost 100 teen-age offspring of MSC employees August 20 twisted, frugged, swam and dogged their way through the EAA-sponsored Teen Dance at the Kemah Elks Lodge. Music was supplied by the Runaways and KILT disc jockey Bill Young MCed the show.

Roundup Swap-Shop

(Deadline for classified ads is the Friday preceding Roundup publication date. Ads received after the deadline will be run in the next following issue. Send ads in writing to Roundup Editor, AP3. Ads will not be repeated unless requested. Use name and home telephone number.)

FOR SALE

Lotus 7 spares for many engines. Pair of 1 1/2" SU carbs, Volvo w/ford-Lotus manifolds and linkage \$35. (Healey, TR, etc) Coxworth A-111 billet cam \$40. Stock Anglia 105-E gearbox \$35 complete. Jon Farbman, WA 6-7192 or RI 7-3435.

1960 Pontiac Star Chief 4-door sedan, power brakes/steering, radio, air, good tires and engine. Vance Jones, HU 4-1321.

3-bdr 2-bath brick colonial in El Lago, air conditioned, landscaped, GE built-ins. \$23,400 or equity and assume \$110/mo payments. Frank Samonski, 877-4795.

4-bdr 2-bath in Arlington Heights, 2-car garage, large family room, corner lot, fenced back yard, central air and heat, carpeted, near schools. Smith, HU 6-1826.

Sunfish sailboat with trailer, \$325. Chuck Pilcher, 877-1806.

1965 Corvette conv, leather trim, 4-speed stick, C&C group, tinted glass, wood steering wheel. AM/FM radio, transistorized ignition, positraction axle, 365-hp engine, good condition. Bill Ritz, 591-3352.

19-ft Thompson 80-hp inboard-outboard, CB radio, depth recorder, fish-fighting chair, air horns, compass, searchlight, bowrail, electric bait well, water skis, ski belts, lifejackets, extra trailer wheel, extra propeller. Perfect condition. \$2900. Bank will finance, will accept small boat in trade, HU 6-5168.

Large 2-story 4-2-2 in Swan Lagoon, shaded, plus extras. \$23,500. Equity plus 5 1/2% loan. Joe Caselli, 932-3722.

Gentle 7 year old Morgan-type mare with 6-month old registered half-Arab filly at side. Another half-Arab foal due in February. Phonicille DeVore, Alvin OL 8-6227 after 5.

1959 Ford 6-cyl with overdrive, needs paint and upholstery, engine in good condition. \$115. HU 6-9338 after 5.

Yellow 1965 Chevy hardtop, V-8 stick, factory air, new tires. \$2095. Prefer to trade \$400 equity for Volkswagen. Jim Stephens, HU 7-0095 after 5.

Johnson Viking Valiant radio transmitter. \$100. George Gibson, Kemah 877-4187.

14 1/2-ft Helton boat, 35-hp Evinrude electric, recently fibreglassed, motor recently overhauled by Helton with new crankshaft, all new parts; Skeeter trailer. All for \$395. D. Briggs, HU 6-5849.

19-in Truetone TV Console. \$20. R. H. Dietz, Dickinson 534-3665.

GE refrigerator, excellent condition, large capacity, white enamel. \$15. W. E. Teasdale, HU 2-7801.

Six contemporary walnut-finish dining chairs—two are "captain's" chairs, \$40. Terry White, 932-4472.

GE deluxe range with attachable grill, oven thermometer, like new, \$100. M. Hamilton, HU 6-7442.

26-in men's bike, \$18. Heavy wood corner speaker enclosure, \$10. C. Mac Jones, 591-3818.

1964 Dodge Dart model 270, 2-door white, V-8 stick, clean, low mileage. R. Hill, Kemah 877-2665.

WANTED

Piano instructor to teach in music studio in MSC area. R. N. Townsend, HU 2-1146 or HU 2-7720.

RIDER POOLS

Want in car pool or will pay beginning Sept. 6 from 2607 Cedar Drive, La Marque to Bldg. 419, 7:30-4 shift. Evelyn Villeneuve, WE 5-3878.

Ride or rider to share driving and expenses this weekend to Corpus Christi; to Memphis soon for week's vacation, and for occasional long-weekend trips. G. Smith, HU 8-2281.

Tickets for the ARCS Scholarship benefit "An Evening in Rome" with Italian tenor Enzo Stuarti are still on sale in the MSC Cafeteria.

Football League Forms

Play is scheduled to start September 26 in the 1966 MSC/Ellington AFB Flag Football League. Team managers who plan to enter teams in the League should register with Dave Mullins at 4521.

Benefit Association Plans Group Life Enrollment Drive

The NASA Employees Benefit Association has scheduled an enrollment drive for the month of September to enroll MSC employees, not currently enrolled, in the NASA Group Life Insurance Plan.

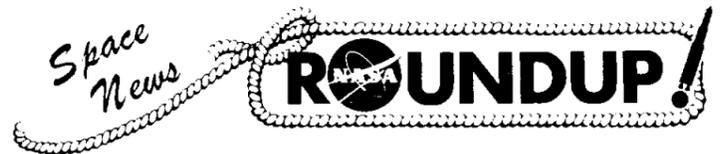
Any full-time, permanent employee is eligible to enroll in the plan and female employees may obtain the same amount of insurance as the men.

W. Kemble Johnson, president of the MSC chapter of the association said, "NASA's group plan is the sensible way to get additional family protection at amazingly low rates."

"Since 1952, NASA has been pooling its life insurance purchases to get higher protection for the lowest dollar cost and now more than 18,000 NASA employees have over \$230,000,000 of life insurance to safeguard the financial security of their families," Johnson stated.

Because many employees may not be aware of the plan's advantages, representatives of the company that underwrite the plan will conduct informational meetings September 12 and 13 at various sites. The time and location of the meetings will be announced.

The current enrollment period ends September 20.



MANNED SPACECRAFT CENTER, HOUSTON, TEXAS

EMPLOYEE NEWS

They Call September 'Hurricane Season'

About this time of year five years ago hurricane Carla crossed the Texas Coast at Port O'Connor and caused millions of dollars in property damage, but thanks to evacuation of residents of low-lying areas, the loss of life was slight.

The hurricane season is here again, and to prepare coastal residents to cope with the threat of a hurricane the American National Red Cross is distributing a leaflet with hurricane precautions and safety measures that every MSC employee should read and heed, especially if he lives in the Galveston Bay area where tides during Carla ran as high as 14 feet.

With all the Tiros and ESSA satellite photo-reconnaissance of global weather conditions available, there is ample warning of the approach of a hurricane. Still it remains the responsibility of the individual homeowner to batten down his house and to

see to it that his family is in a safe place and has ample food, water and medical supplies to last out a long siege of isolation if communications and roads are cut by high water and winds.

Take home one of the Red Cross hurricane leaflets and place it in a handy spot in your home; you may need to refer to it this month.

Megow Speaks To AIAA About Deep-Diving Subs

Inner space instead of outer space will be the topic of the Houston Section American Institute of Aeronautics and Astronautics dinner meeting September 12 at the Holiday Inn on NASA Road 1.

Larry Megow, vice president of the Houston firm of Hahn & Clay, builder of the personnel pressure sphere for the world's first deep-diving submarine *Alvin*, will discuss deep-diving submersibles in general but with particular emphasis on *Alvin*. *Alvin*, capable of diving to depths of 6,000 feet, was used to locate and recover the US hydrogen bomb lost in the Mediterranean off the coast of Spain.

Cocktails will be at 6 pm, dinner (\$3.25 person) at 7 and the program at 8.

Kemah Elks Plan Fish Fry Sunday

MSC employees with an appetite for all the fish they can eat are invited to attend the Kemah BPOE Elks Lodge 2322 annual fish fry September 4 starting at 1 pm. To be held at the Elks Lodge on FM 518 in Kemah, the fish fry will include all the trimmings, free beer, dance music, swimming, games and skeet shooting. Serving will run from

4 until 6:30 pm. At 6 pm a greased pig will be turned loose for anyone under 16 years old to keep if they can catch it.

Tickets, at donations of \$1.50 for adults and \$.75 for children, may be had from Paul Chuites 4866, Ralph Pryor 3405, Leroy Proctor 3379, Charles Nagle 4721 or from Kemah Elks Lodge 877-9995.

UofH Engineering Exes To Hear Cougar Coach

University of Houston engineering alumni now at MSC are invited to attend the Cullen College of Engineering Alumni Association cocktails and dinner September 10 at which the University of Houston head football coach Bill Yeoman will be the featured speaker. Cocktails are at 6:45 pm and dinner (\$3.50/person) is at 7:30 pm in the Houston Engineering and Scientific Society Building at 2615 Fannin.

For reservations call FA 3-2921, and for further information call Leonard Lock at 2786 or Jim Bodmer at 3786.



FLOATING GARAGE—The first flight stage of the Saturn V launch vehicle (S-IC-1) is eased across the wharf at Marshall Space Flight Center into the NASA Barge *Poseidon* on the first leg of a 2,000 mile 10-day voyage by river, canal and ocean to Kennedy Space Center. The 150-ton stage will be at the bottom of the stack in the first Saturn V flight early next year.

First S-IC Flight Stage Starts Voyage to KSC

The NASA-Marshall Space Flight Center shipped the first Saturn V flight booster (S-IC-1) — scheduled to be launched early next year — to the NASA-Kennedy Space Center, Fla., August 26 aboard the barge *Poseidon*.

Poseidon is expected to arrive at KSC in about 10 days. The 2,000 mile waterway route will take the barge through parts of the Tennessee, Ohio and Mississippi Rivers, into the Gulf of Mexico, around the southern tip of Florida, and up the Atlantic

NASA Rules Out Experiment Pallet Hardware Phase

NASA has notified the four firms which completed design studies on the Apollo experiment pallet that there will be no hardware development and fabrication of the pallet.

The four firms are Lockheed Missiles and Space Company, Sunnyvale, California; the Martin Company, Denver, Colorado; McDonnell Aircraft Corporation, St. Louis, and Northrop Space Laboratories, Hawthorne, California.

The firms were selected in November 1965 to perform the four-month Phase C design studies of the pallet, which would carry experiments in the Apollo spacecraft service module.

The NASA decision not to proceed with Phase D (hardware development and fabrication) followed Phases A, B, and C of the phased project planning procurement process, which assured a thorough examination of all factors, both technical and budgetary.

Ocean to the Kennedy Space Center.

The huge booster — which is 138 feet long, 33 feet in diameter and weighs some 300,000 pounds — was moved from a Marshall Center manufacturing building and traveled down a special roadway leading to the Tennessee River.

At KSC, the stage will be mated to the Saturn's two upper stages, the instrument unit and Apollo spacecraft in the world's largest building, the Vehicle Assembly Building.

The Saturn V first stage was captive tested twice earlier this year at MSFC. Its five F-1 engines generate a total thrust of 7.5 million pounds.

The booster was developed jointly by The Boeing Co. and MSFC, where it was assembled. Most major components were built by Boeing at the Michoud Assembly Facility in New Orleans, La., and at the company's plant in Wichita, Kan.

Martin to Build Planetary 'Chutes

The Martin Co., Denver Division, has been selected by NASA for negotiation of a contract to build 11 experimental spacecraft equipped with parachute payloads.

The flight units will be used in experiments to investigate parachute designs and techniques for landing instrumented capsules on Mars. Four will be launched by high-altitude balloon systems. Seven will be carried aloft on Honest John-Nike rockets.

The incentive-type contract with Martin is expected to amount to \$3 million. In addition to designing and building the spacecraft and parachutes, Martin will be responsible for operational support activities, launch vehicle-spacecraft integration and range-spacecraft integration.

The government will provide both the balloon and rocket launch vehicles, range facilities and portions of the required flight and ground equipment.



SECOND FRONT PAGE

Apollo Spacecraft 012 In Preflight KSC Tests

Apollo spacecraft 012 command module last week was delivered to the Manned Spacecraft Operations Building at Kennedy Space Center where it went into initial checkout. The command module, first to be built with a crew-carrying capability, arrived at KSC August 25. Service Module 012 was delivered August 10.

Both modules will be stacked and undergo extensive pre-flight testing, including altitude chamber runs, prior to mating with an uprated Saturn I launch vehicle for compatibility and ground support equipment checkout.

NASA Associate Administrator for Manned Space Flight Dr. George E. Mueller said that the decision to assign a three-man crew to Spacecraft 012 would be made after completion of qualification testing.

Crewmen named to the first manned Apollo mission took part in the detailed pre-delivery checkout of Spacecraft 012 at the North American Aviation Space and Information Systems Division plant at Downey, Calif. Virgil I. "Gus" Grissom, Edward White and Roger Chaffee are prime crewmen for Apollo I and backup crewmen are James McDivitt, David Scott and Russell Schweikart.

Apollo 202

(Continued from Page 1)

caused swells of six to eight feet during spacecraft recovery. The spacecraft was swung inboard onto the ship's aircraft elevator at 9:20 pm CST and the *Hornet* put about on a course for Pearl Harbor for refueling and offloading some gear. Estimate of the *Hornet's* arrival at Long Beach, Calif. for offloading the spacecraft to go to North American S&ISD plant in Downey was recovery plus nine days.

MSC Recovery coordinator Don Stullken aboard the *Hornet* reported that the spacecraft outwardly appeared to have survived the test quite well.

Several Firsts

Apollo 202 expanded the mission experience of Apollo flight hardware by carrying several pieces of equipment and systems on their first flight tests.

The Apollo spacecraft guidance and navigation system, the prime means of controlling spacecraft attitudes and trajectory after launch vehicle separation, was flown for the first time on Apollo 202. The G&N system also controlled the SPS burns and controlled the entry — trajectory by modulating the lift vector made possible by the spacecraft's offset center of gravity. The Apollo fuel cell system underwent its first flight test in Apollo 202, as did the United S-Band system.

Following last Thursday's successful Apollo 202 suborbital unmanned mission for further testing of the Apollo heatshield and of the Saturn I launch vehicle, the prime crew of the first manned Apollo said, "It was a great flight and we are looking forward to flying on the vehicle ourselves in Apollo I."

Three Firms Get Lunar Lab Work

NASA has awarded Warrior Constructors, Inc., and National Electronics Corp., both of Houston, and Natkin & Co., Inc., of Kansas City, Mo., as joint venturers, a contract to complete construction and equip a Lunar Receiving Laboratory at MSC.

The cost-plus-incentive-award fee contract is for approximately \$4.3 million.

The Lunar Receiving Laboratory will provide a central complex where samples of lunar surface material collected by Project Apollo crews will be received, quarantined, examined and later processed for distribution to the scientific community for thorough study and analysis. It also will be equipped to quarantine the spacecraft and crew after the flight to the Moon. The structure will have 84,000 square feet of floor space.

The work, to be completed by the end of 1967, will include pouring floors; installation of interior partitioning, utilities, electrical systems, heating and air conditioning systems; installation and checkout of laboratory equipment consisting of vacuum systems, cabinets for scientific equipment to conduct physical, chemical and biological examination of materials from the lunar surface and low-level radiation counting equipment.

The construction contract does not include specialized scientific instrumentation and equipment which will be purchased separately. Total cost of the laboratory is estimated at \$8 million.

Warrior was one of five firms which submitted proposals to MSC in June.

AFGE Meets Sept. 12

The American Federation of Government Employees, Local 2284, will hold their September meeting at the Webster State Bank, Monday, September 12, at 5 pm. The membership is planning to attend the Educational Seminar to be held at the Sheraton-Lincoln Hotel, on Saturday, November 19.

Interested persons should contact President Jim O'Neill 2261, or Secretary Alma Hurlbert at 3281.

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